

CONOTEC

CONOTEC CO., LTD.
DIGITAL TEMPERATURE CONTROLLER



CNT-TMC100

Instruction Manual



- A user manual for this product is posted on the company website.
- Please download the technical document and communications manual on the company website

01 Safety precautions

Please read the safety precautions carefully for correct operation of the product.

- ※ The specifications and dimensions specified in this instruction manual may be changed without any notice for performance enhancement.

▲ Warning

1. This product was not made as a safe device. Therefore, this product should be attached with dual safety devices if it is used for the control purposes (e.g. a device vulnerable to accident and property damage, etc.).
2. Do not wire, inspect or service this product while the power is being supplied.
3. You must attach this product to a panel. Otherwise, it may cause an electric shock.
4. When connecting the power, you must check the terminal number.
5. Do not ever disassemble, process, modify or repair this product.

▲ Caution

1. Please make yourself familiar with all the operation instructions, safety precautions and warnings before using this product. Comply with related specifications and capacity requirements
2. Do not wire or install this product to any unit with high inductive load (e.g. motor, solenoid, etc.).
3. Use a shielded cable with a proper length when extending a sensor.
4. Do not use any part that generates an arc when used in the same power or directly switched in close proximity.
5. Keep the power cable away from a high-voltage cable and do not install this product in any place that is full of water, oil and dust.
6. Do not install this product in any place that is exposed to direct sunlight or rain.
7. Do not install this product in any place that is subject to strong magnetic power, noise, vibration or shock.

8. Keep this product away from any place that generates strong alkaline or acid substances. Use a separate pipe.
9. Do not sprinkle water onto this product for cleaning when installing it in the kitchen.
10. Do not install this product in any place where the temperature/humidity ratings are exceeded
11. The sensor cable should not be cut or cracked..
12. Keep the sensor cable away from a signal cable, a power cable or a load cable. Use a separate pipe.
13. Keep in mind that the follow-up service will not be available if this product has been arbitrarily disassembled and modified
14. ⚠ symbol on the terminal wiring diagram indicates a safety statement that alerts a warning or caution.
15. Do not use this product near any device generating strong high-frequency noise (e.g. high-frequency welding machine, high-frequency sewing machine, high-frequency radio, large-capacity SCR controller, etc.).
16. Using this product in any method other than those specified by the manufacturer may lead an injury or a property damage
17. The product is not a toy. Keep it away from children.
18. The product should be installed only by an expert or a qualified person.
19. The company will not be liable for any damage caused by the violation of the above warnings and cautions or by a consumer's fault

▲ Danger

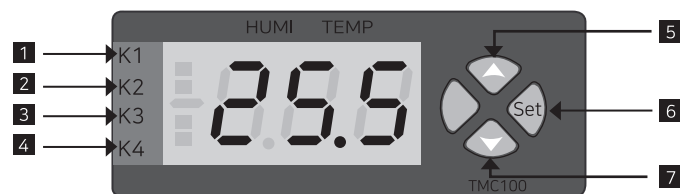
Caution: Risk of electric shock

- Electric shock - Do not touch the AC terminal while the current is flowing. It may cause an electric shock.
- You must disconnect the input power when servicing it.

02 Model Types

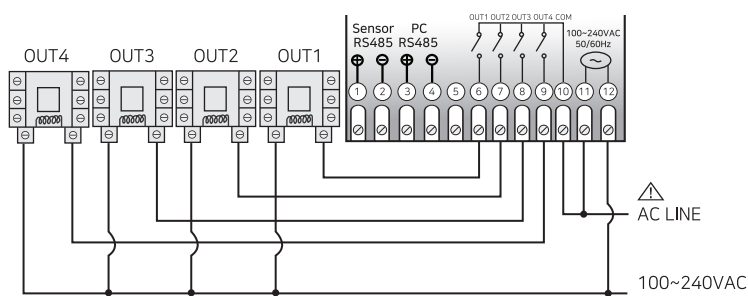
Model	Sensor	Control method	Temp-Humi range	Power	Function
CNT-TMC100 (Transmitter Controller)	CNT-TM100 (Up to 4 Units)	Relay Contact (4EA)	TEMP : - 20.0 ℃ ~ + 80.0 ℃ Humi : 0.0 % ~ + 100 %	100~240 VAC 50/60Hz	TEMP Control Humi Control Alarm Output 485 Comm.

03 Components



- | | | | | | |
|---|------------------------|---|------------------------|---|-------------------|
| 1 | OUT1 output indication | 2 | OUT2 output indication | | |
| 3 | OUT3 output indication | 4 | OUT4 output indication | | |
| 5 | Increasing Switch | 6 | Setting Switch | 7 | Decreasing Switch |

04 Terminal wiring diagram



- ※ Relay contact capacity is less than 250VAC 2A.

If using the load to exceed contact capacity, be cautious on those can be caused by contact deposited, contact failure, relay damaged, etc.

05 Function details

E80 : Change various settings for communication and others

E81 : Change various settings for connected sensors

E82 ~ E85 : Change various settings for connected sensors

E51 E52 E53 E54 : EV2 ~ EV5 temperature setting (-20.0 ~ 80.0℃)

H51 H52 H53 H54 : EV2 ~ EV5 humidity setting (0.0 ~ 100%)

S7A : Sensor quantity setting
- Set the number of sensors (TM100) to be connected
- If controlling 2 units of TM100, set SMA: 2

ADR : Communication code setting
- Menu for setting the communication code (1~99)

bPS : Communication speed setting
- 1200BPS / 2400BPS / 4800BPS / 9600BPS / 19200BPS

LoC : Setting locking function
- A safety device that prevents various setting values from being changed except for the main user.
- Setting *on* : Lock all settings except set temperature value LOCK.
- Setting *off* : Unlock all setting values except for setting temperature values.

1 r1 : Reset settings
- When set to *r5t*: Product model is shown, then current temperature is displayed.
※ Caution: All settings return to factory defaults. Check again before use.

SE1 SE2 SE3 SE4 : Sensor use setting

- *no* : Not displayed; no control action (sensor unused)
- *1 ~ 99* : Must match TM100 communication address (ADR) for comm.

EY1 EY2 EY3 EY4 : Sensor control setting

- *d1 B* : Displays Temp/Humi of the TM100 with matching address (individual control)
- *ABr* : Displays average Temp/Humi of sensors set to *ABr* (average control)

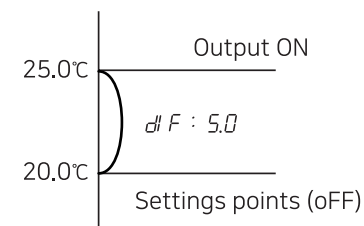
EYP : Per-sensor output setting
EOU : Temp output control **HOu** : Humidity output control
EAR : Temp alarm output **HAR** : Humidity alarm output

FSE : Output function selection (shown when *EOU* / *HOu* is set)
- *C* : Cooling / *H* : Heating or Humidifying / *d* : Dehumidifying

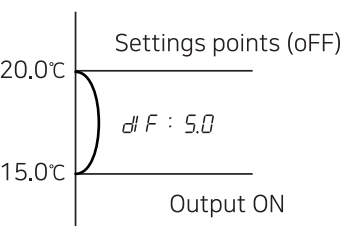
d1 F : Setting for temperature deviation
- In the ON/OFF control, it needs at regular interval between ON and OFF.
- By operating the ON/OFF control frequently, the realy or its output contact can be damaged quickly and it also occurs the hunting (oscillating,chattering) by virtue of external noise.
- You can make use of the temperature deviation in order to protect its realy or contact and so on.

[When Cooling or Dehumidifying] [When Heating or Humidifying]

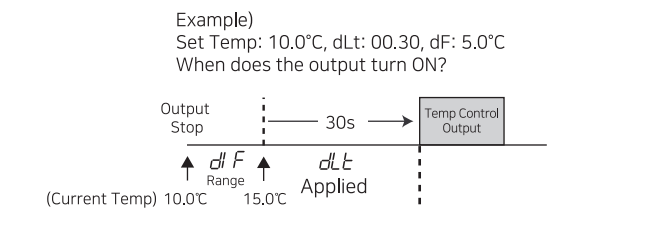
EX1) Setting Temp : 20.0℃,
EYP : *C*, *d* *d1 F* : 5.0



EX2) Setting Temp : 20.0℃,
EYP : *H* *d1 F* : 5.0



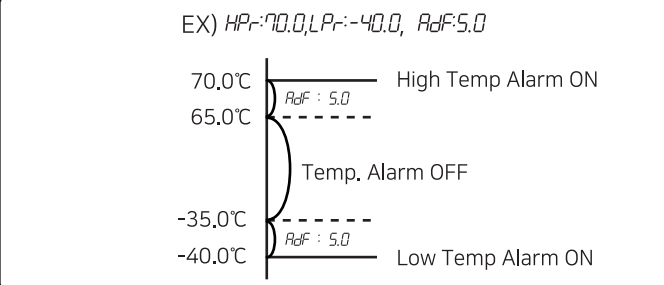
dLt : Output Delay Time
- It is widely used as the followings in case of operating the ON/OFF control very often, (Cooler,Compressor and so on)
- To protect the operation machinery when re-input of the power supply or momentary stoppage of power supply.



HPr : High limit alarm temp. setting

LPr : Low limit alarm temp. setting

RdF : Temp Alarm deviation setting

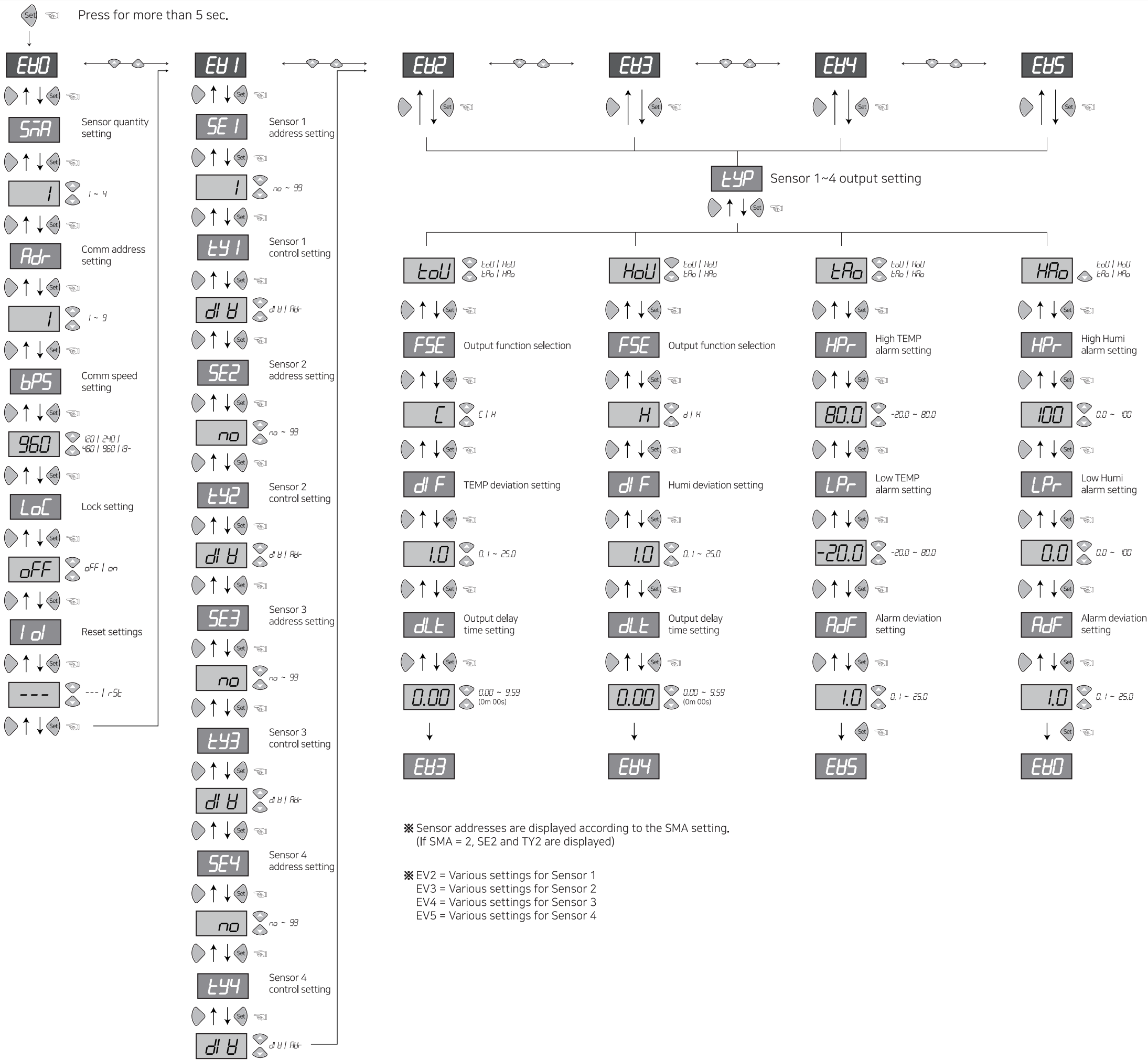


06 Setting process

Temp & Humi Settings



Program setting (The value of each item is the factory setting.)



07 Communication Description

* RS485 MODBUS RTU protocol is built-in.

* Asynchronous 2-wire half-duplex communication method / Communication distance: within 1.2 km

* Communication speed: 1200 / 2400 / 4800 / 9600 / 19200 Bps

* Start bit: 1 bit, Stop bit: 1 bit, Parity bit: None, Data bit: 8 bits

[Func 0x02 : Read Discrete Inputs] - You can receive a brief information in the for of bits, such as a sensor status and a decimal.

Sub products address	command	start address high byte	low byte	number of data high byte	low byte	CRC16 low byte	high byte
1BYTE	0x02	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Request 01 02 00 00 00 01 B9 CA
Response 01 02 01 00 A1 88

Sub products address	command	Number of data	Data	CRC16 low byte	high byte
1BYTE	0x02	1BYTE	1BYTE	1BYTE	1BYTE

100001 (0000)
sensor open error

NO	Address	Description	Range	Unit
20001	0000	OUT1 Output Status	bit0 0:OFF / 1:ON	
20002	0001	OUT2 Output Status	bit1 0:OFF / 1:ON	
20003	0002	OUT3 Output Status	bit2 0:OFF / 1:ON	
20004	0003	OUT4 Output Status	bit3 0:OFF / 1:ON	

[Func 0x04 : Read Input Registers] - You can receive basic information such as current TEMP, sensor status, decimal point, and output status.

Sub products address	command	start address high byte	low byte	number of data high byte	low byte	CRC16 low byte	high byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

byte numbers = data numbers * 2
data numbers = if 5 total 5 numbers data, 10 numbers byte receiving

Sub products address	command	Byte numbers	DATA1 high byte	low byte	...	DATA n high byte	low byte	CRC16 low byte	high byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE	...	1BYTE	1BYTE	1BYTE	1BYTE

NO	Address	Description	Range	Unit
30001	0000	Product Model Name	"CN"	ASCII
30002	0001	Product Model Name	"T-"	ASCII
30003	0002	Product Model Name	"TM"	ASCII
30004	0003	Product Model Name	"C1"	ASCII
30005	0004	Product Model Name	"00"	ASCII
:				
30111	000A	Firmware version	the front decimal place	INT
30112	000B	Firmware version	the last decimal place	INT
:				
30101	0064	Sensor 1 TEMP (SE1)	-20.0 ~ 80.0℃	℃
30102	0065	Sensor 1 Humi (SE1)	0.0 ~ 100%	%
30103	0066	Sensor 2 TEMP (SE2)	-20.0 ~ 80.0℃	℃
30104	0067	Sensor 2 Humi (SE2)	0.0 ~ 100%	%
30105	0068	Sensor 3 TEMP (SE3)	-20.0 ~ 80.0℃	℃
30106	0069	Sensor 3 Humi (SE3)	0.0 ~ 100%	%
30107	006A	Sensor 4 TEMP (SE4)	-20.0 ~ 80.0℃	℃
30108	006B	Sensor 4 Humi (SE4)	0.0 ~ 100%	%
30109	006C	Sensor 1 Usage Status	0: Not Used / 1: Used	Bit0
		Sensor 2 Usage Status	0: Not Used / 1: Used	Bit1
		Sensor 3 Usage Status	0: Not Used / 1: Used	Bit2
		Sensor 4 Usage Status	0: Not Used / 1: Used	Bit3
		Sensor 1 Error (N-S)	0: Normal / 1: Error	Bit4
		Sensor 2 Error (N-S)	0: Normal / 1: Error	Bit5
		Sensor 3 Error (N-S)	0: Normal / 1: Error	Bit6
30110	006D	Sensor 4 Error (N-S)	0: Normal / 1: Error	Bit7
		Sensor 1 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
		Sensor 2 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
		Sensor 3 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30112	006F	Sensor 4 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30113	0070	Sensor 4 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30114	0071	Sensor 1 Output Status (OUT1)	0: OFF / 1: ON	Bit0
		Sensor 2 Output Status (OUT2)	0: OFF / 1: ON	Bit1
		Sensor 3 Output Status (OUT3)	0: OFF / 1: ON	Bit2
		Sensor 4 Output Status (OUT4)	0: OFF / 1: ON	Bit3

[Func 0x03 : Read Holding Registers] - You can read the setting values.

Address	Command	Starting address Upper Byte	Lower Byte	Number of data Upper Byte	Lower Byte	CRC16 Lower Byte	Upper Byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[Response]

Address	Command	Number of Byte	Data1 Upper Byte	Lower Byte	...	Data n Upper Byte	Lower Byte	CRC16 Lower Byte	Upper Byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	...	1BYTE	1BYTE	1BYTE	1BYTE

Number of bytes = Number of data*2
If data count = 23, total 23 data, 46 bytes received

[Func 0x06 : Write Single Register]

- You can change one setting value item at a time.

- If written normally, the contents of Request and Response are the same.

[Request / Response]

Address	Command	Write address Upper Byte	Lower Byte	Data Upper Byte	Lower Byte	CRC16 Lower Byte	Upper Byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[Func 0x10 : Write Multiple Registers]

- You can change the setting value multiple items at once.

- When you write multiple registers, if there is an error in the data,

it will not be written all over.

[Request]

Address	Command	Starting address Upper Byte	Lower Byte	Number of data Upper Byte	Lower Byte	Number of Byte	Data1 Upper Byte	Lower Byte	...	Data n Upper Byte	Lower Byte	CRC16 Lower Byte	Upper Byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	...	1BYTE	1BYTE	1BYTE	1BYTE

[Response] Number of Data = Number of Bytes × 2

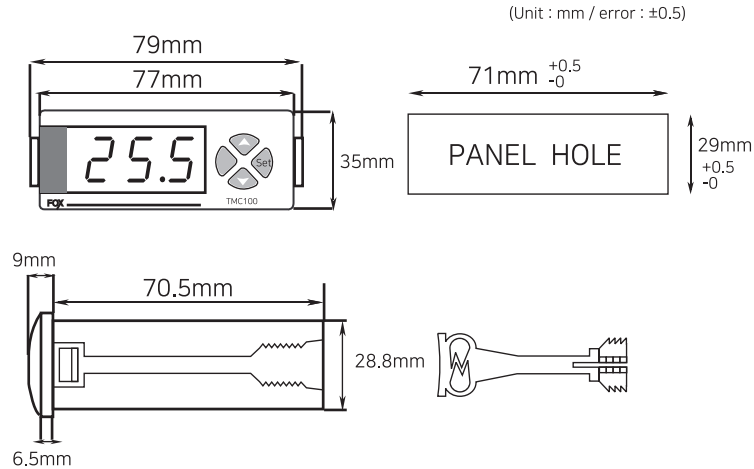
Address	Command	Starting address Upper Byte	Lower Byte	Number of Byte Upper Byte	Lower Byte	CRC16 Lower Byte	Upper Byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[MAP] Func 0x03, 0x06, 0x10

NO	Address	Description	Range	Unit
30001	0000	Sensor 1 TEMP Set	-20.0 ~ 80.0℃	℃
30002	0001	Sensor 1 Humi Set	0.0 ~ 100.0%	%
30003	0002	Sensor 2 TEMP Set	-20.0 ~ 80.0℃	℃
30004	0003	Sensor 2 Humi Set	0.0 ~ 100.0%	%
30005	0004	Sensor 3 TEMP Set	-20.0 ~ 80.0℃	℃
30006	0005	Sensor 3 Humi Set	0.0 ~ 100.0%	%
30007	0006	Sensor 4 TEMP Set	-20.0 ~ 80.0℃	℃
30008	0007	Sensor 4 Humi Set	0.0 ~ 100.0%	%
30009	0008	Sensor Quantity Setting	1 ~ 4	
30010	0009	Comm address setting	1 ~ 99	
30011	000A	Comm speed setting	0 : 1200 / 1 : 2400 / 2 : 4800 3 : 9600 / 4 : 19200	
30012	000B	Lock setting	0: Not Used / 1 : Lock	
30013	000C	Reset Settings	0: Not Used / 1 : Reset	
30014	000D	Sensor 1 Address Setting	0: Not Used / 1 ~ 99	
30015	000E	Sensor 1 Control Setting	0: Individual Control / 1: Average Control	
30016	000F	Sensor 2 Address Setting	0: Not Used / 1 ~ 99	
30017	0010	Sensor 2 Control Setting	0: Individual Control / 1: Average Control	
30018	0011	Sensor 3 Address Setting	0: Not Used / 1 ~ 99	
30019	0012	Sensor 3 Control Setting	0: Individual Control / 1: Average Control	
30020	0013	Sensor 4 Address Setting	0: Not Used / 1 ~ 99	
30021	0014	Sensor 4 Control Setting	0: Individual Control / 1: Average Control	
30022	0015	Sensor 1 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30023	0016	Sensor 1 Output Function Selection	0: H (Heating or Humidifying) 1: C, D (Cooling or Dehumidifying)	
30024	0017	Sensor 1 TEMP/Humi Deviation Setting	0.1 ~ 25.0	
30025	0018	Sensor 1 Output Delay Time Setting	0 ~ 9	
30026	0019	Sensor 1 High TEMP Alarm Setting	0 ~ 59	
30027	001A	Sensor 1 High TEMP Alarm Setting	-20.0 ~ 80.0	
30028	001B	Sensor 1 Low TEMP Alarm Setting	-20.0 ~ 80.0	
30029	001C	Sensor 1 High Humi Alarm Setting	0.0 ~ 100.0	
30030	001D	Sensor 1 Low Humi Alarm Setting	0.0 ~ 100.0	
30031	001E	Sensor 1 Alarm Deviation Setting	0.1 ~ 25.0	
30032	001F	Sensor 2 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30033	0020	Sensor 2 Output Function Selection	0: H (Heating or Humidifying) 1: C, D (Cooling or Dehumidifying)	
30034	0021	Sensor 2 TEMP/Humi Deviation Setting	0.1 ~ 25.0	
30035	0022	Sensor 2 Output Delay Time Setting	0 ~ 9	
30036	0023	Sensor 2 High TEMP Alarm Setting	0 ~ 59	
30037	0024	Sensor 2 High TEMP Alarm Setting	-20.0 ~ 80.0	
30038	0025	Sensor 2 Low TEMP Alarm Setting	-20.0 ~ 80.0	
30039	0026	Sensor 2 High Humi Alarm Setting	0.0 ~ 100.0	
30040	0027	Sensor 2 Low Humi Alarm Setting	0.0 ~ 100.0	
30041	0028	Sensor 2 Alarm Deviation Setting	0.1 ~ 25.0	
30042	0029	Sensor 3 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30043	002A	Sensor 3 Output Function Selection	0: H (Heating or Humidifying) 1: C, D (Cooling or Dehumidifying)	
30044	002B	Sensor 3 TEMP/Humi Deviation Setting	0.1 ~ 25.0	
30045	002C	Sensor 3 Output Delay Time Setting	0 ~ 9	
30046	002D	Sensor 3 High TEMP Alarm Setting	0 ~ 59	
30047	002E	Sensor 3 High TEMP Alarm Setting	-20.0 ~ 80.0	
30048	002F	Sensor 3 Low TEMP Alarm Setting	-20.0 ~ 80.0	
30049	0030	Sensor 3 High Humi Alarm Setting	0.0 ~ 100.0	
30050	0031	Sensor 3 Low Humi Alarm Setting	0.0 ~ 100.0	
30051	0032	Sensor 3 Alarm Deviation Setting	0.1 ~ 25.0	

30052	0033	Sensor 4 Output Setting	0: TEMP / 1: Humi / 2: TEMP Alarm / 3: Humi Alarm	
30053	0034	Sensor 4 Output Function Selection	0: H (Heating or Humidifying) 1: C, D (Cooling or Dehumidifying)	
30054	0035	Sensor 4 TEMP/Humi Deviation Setting	0.1 ~ 25.0	
30055	0036	Sensor 4 Output Delay Time Setting	0 ~ 9	
30056	0037	Sensor 4 High TEMP Alarm Setting	0 ~ 59	
30057	0038	Sensor 4 High TEMP Alarm Setting	-20.0 ~ 80.0	
30058	0039	Sensor 4 Low TEMP Alarm Setting	-20.0 ~ 80.0	
30059	003A	Sensor 4 High Humi Alarm Setting	0.0 ~ 100.0	
30060	003B	Sensor 4 Low Humi Alarm Setting	0.0 ~ 100.0	
30061	003C	Sensor 4 Alarm Deviation Setting	0.1 ~ 25.0	

08 Diemension and panel hole sizes



09 Easy error diagnosis instructions

※ If an error is displayed while the product is running

- E_r**: It is case where the product was subject to a strong external noise and internal data memories have been damaged
In this case, contact us for product service.

- Although this controller was designed to withstand a certain level of external noise, it is not supposed to withstand all levels of noise.

- If the product is subject to a noise greater than 2KV, it could be internally damaged.

- n-5** If a message like No Signal appears, it indicates a sensor fault.
Please check the sensor.

- If the TEMP display alternates between **t_{rn}** **100**, all sensors are set to NO (not in use).

- o-k** If a message like O-K appears, the setting values have been successfully saved.

- LoCk** If a message like Lock appears, the product is in a locked state.

- t_{rn}** If a message like Product Name appears, it shows the product model name.

※ The above specifications may be changed without any notice for performance enhancement. Please make yourself fully familiar with and follow the above precautions.

■ Warranty period: One year from the date of purchase

■ Address : (Street address) 56, Ballyongsandan 1-rp, Jangan-eup, Gijang-gun, Busan, ROK
(Land-lot address) 901-1, Ballyong-ri, Jangan-eup, Gijang-gun, Busan, ROK (46034)

- Product service : 070-7815-8289
- Customer service : 051-819-0425 ~ 0427
- FAX : 051-819-4562
- Email : overseas-sales@conotec.co.kr
- SNS : Facebook, Instagram, Twitter, YouTube ► 'Search for 'Conotec'
- Website : www.conotec.co.kr

◆ Installation precautions

- This device should be connected to a protective earth terminal and a power supply in order to prevent an electric shock.
- Do not block the air outlet.

◆ Operation precautions

※ An operating environment of this device is as follows.

- Ambient temperature : 0 ~ 60℃
 - Ambient humidity : 80%RH or less
 - Indoor uses only
 - Pollution class 2
 - Altitude under 2000m
 - Installation category : II
- This device should be laid out in a way that its power cord is easy to handle.

■ Using this product in any method other than those specified by the manufacturer may damage its protection function

■ Major products and development

- Temperature/humidity controller
- Heat pump controller
- Counter and timer controller
- Chiller controller
- Current and voltage panel meter
- Thermo-hygrostat controller
- Temperature/humidity indicator
- Short message alarm
- Oven controller
- Temperature/humidity transmitter
- CO2 controller
- Smartphone app and monitoring system
- PID controller
- Unit cooler controller

※ This manual was prepared in the Naver Nanum fonts.